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$$\textcircled{1} x^2y + xy^2 = 0$$

$$2xy + x^2 \frac{dy}{dx} + y^2 + 2y \frac{dy}{dx} = 0$$

$$2xy + x^2 \frac{dy}{dx} + y^2 + 2xy \frac{dy}{dx} = 0$$

$$x^2 \frac{dy}{dx} + 2xy \frac{dy}{dx} = -2xy - y^2$$

$$\frac{dy}{dx} (x^2 + 2xy) = -2xy - y^2$$

$$\frac{dy}{dx} = \frac{-2xy - y^2}{x^2 + 2xy}$$

$$\textcircled{3} y^2 = \frac{x-1}{x+1}$$

$$2y \frac{dy}{dx} = \frac{(1)(x+1) - (x-1)(1)}{(x+1)^2}$$

$$2y \frac{dy}{dx} = \frac{x+1 - x+1}{(x+1)^2}$$

$$2y \frac{dy}{dx} = \frac{2}{(x+1)^2}$$

$$\frac{dy}{dx} = \frac{2}{2y(x+1)^2} = \frac{1}{y(x+1)^2}$$

$$\textcircled{2} x^3 + y^3 = 18xy$$

$$3x^2 + 3y^2 \frac{dy}{dx} = 18(1y) + x(1) \frac{dy}{dx}$$

$$3x^2 + 3y^2 \frac{dy}{dx} = 18y + 18x \frac{dy}{dx}$$

$$3y^2 \frac{dy}{dx} - 18x \frac{dy}{dx} = 18y - 3x^2$$

$$\frac{dy}{dx} (3y^2 - 18x) = 18y - 3x^2$$

$$\frac{dy}{dx} = \frac{18y - 3x^2}{3y^2 - 18x} = \frac{3(6y - x^2)}{3(y^2 - 6x)} = \frac{6y - x^2}{y^2 - 6x}$$

$$\textcircled{4} x^2 = \frac{x-y}{x+y}$$

$$2x = \frac{(1 - \frac{dy}{dx})(x+y) - (x-y)(1 + \frac{dy}{dx})}{(x+y)^2}$$

$$2x = \frac{x+y - x \frac{dy}{dx} - y \frac{dy}{dx} - (x+y - y \frac{dy}{dx} - x \frac{dy}{dx})}{(x+y)^2}$$

$$2x(x+y)^2 = x+y - x \frac{dy}{dx} - y \frac{dy}{dx} - x+y + y \frac{dy}{dx} + x \frac{dy}{dx}$$

$$2x(x+y)^2 = 2y - 2x \frac{dy}{dx}$$

$$2x(x+y)^2 - 2y = -2x \frac{dy}{dx}$$

$$\frac{2x(x+y)^2 - 2y}{-2x} = \frac{dy}{dx} = \frac{\frac{2x(x+y)^2}{-2x} - \frac{2y}{-2x}}{-2x} = \frac{(x+y)^2 - y}{-x}$$